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ABSTRACT

Differences in academic performance of residents in the various sections and dormitories during the fall semester 1974 at North Carolina State University were studied. Other study objectives were as follows: to develop a methodology to measure academic performance of freshmen residents adjusted for ability, sex, and differential grading distributions in the various schools of the university; to determine whether seniority on the resident advisor staff relates to academic performance of freshman residents in each section; to determine whether architectural style of residence hall relates to academic performance of freshmen residents; and to determine whether there is a relationship between percentage of freshmen in a hall or section and academic performance. As a whole, freshmen residing in the low-rise, open circulation suite building performed better than those in high-rise, open circulation suite buildings. When academic performance is adjusted for ability, sex, and school of study, freshmen in some halls performed better than those in others. No significant relationship was found between resident advisor seniority and grade point average, and no significant results were found for percentage of freshmen in a living unit and grade point average. (SW)

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THE DIFFERENCE BETWEEN POTENTIAL AND ACHIEVED ACADEMIC PERFORMANCE OF FRESHMEN RESIDENTS AT NORTH CAROLINA STATE UNIVERSITY

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INTRODUCTION

In recent years there has been a great deal of concern about effects of residence halls and residential programming upon those students who reside within. As observed by Chickering (1974, p. 84), recent research efforts have produced evidence to indicate that residence hall environments produce desirable personal development:

> ...Whatever the institution, whatever the group, whatever the data, whatever the methods of analysis, the findings are the same. Students who live at home with their parents fall short of the kinds of learning and personal development typically desired by the institution they attend and which might reasonably be expected with their special backgrounds taken into account. Students who live in college dormitories exceed the learning and personal development that are predicted when their advantages in ability, in prior education extracurricular activities, and in community and family backgrounds are taken into account.

The research literature seems to be consistent in reporting that academic performance is more favorable for residents than commuters provided that sample sizes are large (Astin, 1973; and Hountras and Brandt, 1970) and that special educational programming in residence halls encourages academic growth (Snead and Caple, 1971; and Taylor and Handson, 1971).

This paper presents a methodology that was constructed and employed to measure academic performance of freshmen residents relative to their predicted performance within their peer group. Using this procedure, differences in academic performance of residents in the various sections and buildings during the fall semester 1974 at North Carolina State University are described. More specifically, this study was conducted to meet the following objectives:

1. To develop a methodology to measure academic performance of freshmen residents adjusted for ability, sex, and differential grading distributions in the various schools of this university.
2. To determine whether or not there are differences in academic performance between freshmen residents in various residence halls and sections of residence halls at North Carolina State University.
3. To determine whether or not seniority on the resident advisor staff relates to academic performance of freshman residents in one's section.
4. To determine whether or not architectural style of residence hall relates to academic performance of freshmen residents.
5. To determine whether or not there is a relationship between percentage of freshmen in a hall or section and academic performance.

PROCEDURE

A. Population: The population for this study consisted of all new freshmen students who were living in residence halls at North Carolina State University in fall, 1974. Addresses used for this study were the locations of the residents during the semester.

B. Variables used in the study have been defined as follows:

Adjusted University Predicted Grade Average (ADJUPGA)* is the individual's university predicted grade average (UPGA) minus the mean UPGA for the students in the same school and the same sex. The UPGA is an estimate of a student's first year cumulative grade-point-average based upon a weighted combination of his high school class rank, SAT-M score, and SAT-V score. The equation used to produce the UPCA is based upon the performance of the most recent freshman class.

Adjusted Grade Point Average (ADJGPA)* is the individual's grade-point-average (GPA) for fall, 1974 minus the mean GPA for students in the same school and of the same sex.

Adjusted Gain (ADJGAIN)* is the ADJUPGA minus the ADJGPA for an individual.

Peer Group is the group of freshmen enrolled in the same academic school and of the same sex.

Architectural Type is an architectural configuration for a building based upon its height (low rise or high rise), basic room configuration (hallway or suite), and means of circulation between rooms (open or closed).

Section is an architectural sub-unit of a residence hall (such as a floor or wing) housing from 40 - 70 residents who are supervised by one undergraduate resident advisor. The exact areas for each section have been defined in Table 2.

Resident Advisor Seniority is the number of years which a resident advisor has served in that capacity. All figures for this variable were rounded to the next highest whole year.

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*The mathematical procedure to define ADJUPGA, ADJGPA, and ADJGAIN scores was suggested by Mrs. Kathy Council, Statistical Analyst, Department of Student Affairs Planning and Research.

Special Educational Programming - the enrichment of the residential milieu by regular systematic inclusion of supplemental education activities, e.g., seminars, classes, film series, etc. Special educational programming consisted of the following:

1. The Living-Learning Program housed in Metcalf Hall was directed toward all freshmen residing there. It provided conventional classroom activities and seminars within the building. Additionally, the Head Residence Counselor taught first-level, undergraduate economics courses in the hall. Upperclassmen were chosen from former Living-Learning program participants on the basis of their commitment to promoting an academic climate.
2. The Transition Program has been conducted for a select group of freshmen in otherwise conventional halls (Becton, Berry, and Bagwell) as an alternative to freshman year. It consisted largely of experiential learning activities emphasing small group interaction.

C. Data Analysis

1. An ADJGAIN score was computed for each freshman residing in the halls during the fall semester 1974 using the previously mentioned formula. For example: if a student had a UPGA of 2.4 and his peer group had a mean UPGA of 2.3, his ADJUPGA would be +.1(2.4-2.3=+.1). If the student achieved a GPA of 2.5 while his peer group achieved a mean GPA of 2.6, his ADJGPA would have been -.1(2.5-2.6=-.1). Therefore his ADJGAIN score would be -.2(-.1- +.1=-.2). Although this student did better than predicted, his ADJGAIN score was negative because the difference between his prediction and his performance was less than that of his peer group.
2. Mean ADJGAIN scores were then computed for each resident hall building (Table 1), section (Table 2), and architectural type (Table 3). Additional mean ADJGAIN scores were computed for residents according to the seniority of their resident advisor (Table 4). A two-tailed t-test was used to determine whether or nor there were significant differences between ADJGAIN scores.
3. The correlation between mean ADJGAIN scores and percentage of freshmen in a living unit was computed for each of the following (Table 5 and Charts 1 - 3).
   a. All residence halls
   b. All residence halls excluding those with special educational programs.

c. All sections.

4. Mean ADJGAIN scores were plotted against percentage of freshmen for these groups, and the regression lines used to predict these scores are shown in Charts 1-3.

RESULTS

A. As shown in Table 1, freshmen in Berry and Bragaw halls had ADJGAIN scores which were significatnly higher than zero with mean scores of +.165 and +.133 respectively, while those in Sullivan hall scored significantly below zero with a mean ADJGAIN score of -.083. This indicates that as a group, freshmen in Bragaw and Berry halls performed better, while those in Sullivan performed worse than their peer group when academic performance is adjusted for ability, sex, and school of study.

B. ADJGAIN scores for various sections ranged from -.55 to +.58 with a mean score of +.36 (Table 2). Sections scoring significantly above zero were:

1. Bragaw, 2nd floor D wing — mean = + .47
2. Alexander, 3rd floor, — mean = + .32
3. Berry, Basement and 1st floor — mean = + .32
4. Metcalf, 4th floor, — mean = + .27
5. Metcalf, 8th floor — mean = + .20
6. Bragaw, 4th floor D wing — mean = + .37

The one section scoring significantly below zero was Bragaw 1st floor, B wing, mean = -.39.

C. No significant relationship was found between resident advisor seniority and mean ADJGAIN scores (Table 3).

D. The low-rise, open circulation suite building (Bragaw) scored significantly higher than zero (ADJGAIN = +.138) while the high-rise, open circulation buildings (Lee and Sullivan) scored significantly below zero (ADJGAIN = -.068) (Table 4). It is curious to note that these buildings are neighbors and the architectural difference is that Bragaw has four floors broken into identifiable wings, while Lee and Sullivan have nine and twelve floors respectively and are not subdivided on the floors other than by suites.

E. The analysis comparing percentage of freshmen in a section and mean ADJGAIN for that living unit yielded no significant results. Additionally, no significant relationship was found between percentage of freshmen and mean ADJGAIN scores for all residence halls. However, a significant correlation,

-.788 ($p<.002$), was found between mean ADJGAIN scores and percentage of freshmen for those halls without special educational programming (See Table 5). As shown by comparing Charts 1 and 2, three halls involved in the two special educational programs (Metcalf:Living-Learning and Berry and Becton:Transition Program) which were removed from this analysis were above the regression line. In other words, the mean ADJGAIN for these halls were higher than expected. It should be noted that all the freshmen in Metcalf, almost all of those in Berry, but only about one-fourth from Becton were involved in the special educational programs in their respective halls. The fourth hall which contained special educational programming, Bagwell, was not removed from this analysis because only seven of the forty-two freshmen in the hall were involved in the Transition Program.

DISCUSSION

The data presented indicate that there are significant differences in academic performance of students residing in a few sections and buildings at this university when the effects of differential academic potential and differences in grade distributions by school and sex have been removed. Students in some sections and buildings performed above prediction while those in other buildings and sections performed below prediction. In most buildings and sections however, student performance was equal to prediction.

No data were presented to indicate that seniority as a Resident Advisor is related to performance of one's residents. Therefore, an administrative policy based upon an assumption of performance deteriorating with seniority cannot be justified on the basis of these data.

As a whole, freshmen residing in the low-rise, open circulation suite building performed better than those in high-rise, open circulation suite buildings. Since only one of the former and two of the latter architectural types exist on this campus, care must be exercised in making any generalizations based on this difference.

Two hypotheses to explain the fact that no significant results were found for percentage of freshmen in a living unit and ADJGAIN scores are:

1. Functional Relationship. As the percentage of freshmen in a section (building) increases, the frequency of anti-intellectual disruptive behavior also increases, leaving less time and worse conditions for academic endeavors. Additionally, the freshmen had had less of an opportunity to learn good study habits and other essentials of academic

success from upperclassmen. The combined result is less successful academic behavior and poorer grades.

2. Self Selection. The environmental climate is set by upperclassmen who have migrated to certain areas. If freshmen's expectations do not match the environment, they move to areas where the conditions are more consistent with their desires.

The second hypothesis seems more plausible particularly considering the data relating ADJGAIN scores to percentages of freshmen by section. The plot for these variables (Chart 3) demonstrates no relationship as would have been expected had the first explanation been correct.

It appears then that mere presence of large percentages of freshmen in a hall or section, within the range of scores shown in this report, is neither detrimental nor conducive to academic pursuit during the first semester. More important are the characteristics of those upperclassmen who provide the behavioral clues as to the kind of lifestyle considered correct. Strategies to create halls which promote academics should be cognizant of this and should therefore place considerable importance upon recruiting and keeping the kinds of informal leaders who exemplify the program's goals.

If one believes that the migration of academically inclined and recreationally inclined to congregate in certain residential areas of campus is essentially self selection based upon the perceived climate, it would appear that efforts to change the image of Sullivan to more of an academic community would have beneficial results. However, care must be taken to insure that the result is not just the transfer of a problem to different areas by promoting an academic community which drives "party-ers" out of one building and into another.

TABLE 1

MEAN SCORES FOR BUILDINGS

RANK ORDERED BY ADJUSTED GAIN

	ADJGAIN	ADJUPGA	ADJGPA	# Of FRESHMEN	BUILDING SIZE	% Of FRESHMEN
Berry	.165*	.124	.290	36	84	42.9
Bragaw	.138*	-.013	.126	131	815	16.1
Welch	.106	-.125	-.019	4	61	6.6
Syme	.078	-.015	.063	53	234	22.6
Alexander	.070	-.048	.022	42	190	22.1
Carroll	.064	.002	.067	116	360	32.2
Becton	.044	.061	.104	85	231	36.8
Turlington	.032	.009	.041	29	199	14.6
Bagwell	.020	.003	.024	42	182	23.1
Metcalf	.012	.065	.077	296	440	67.3
Tucker	-.001	.013	.012	124	350	35.4
Bowen	-.019	.046	.026	119	320	37.2
Lee	-.045	-.054	-.100	227	810	28.0
Owen	-.054	.022	-.032	120	410	29.3
Gold	-.083	-.014	-.097	29	61	47.5
Sullivan	-.083*	-.066	-.150	323	808	40.0

*ADJGAIN significantly different from 0, $p<.05$

TABLE 2

MEAN SCORES BY SECTION

Building	Section/ floor	ADJGAIN	ADJUPGA	ADJGPA	# of Freshmen
Alexander	1st	.04	.18	.22	9
	2nd	-.18	-.16	-.34	16
	3rd	.33*	-.05	.28	17
Bagwell	1st	.24	.22	.46	13
	2nd	-.03	-.05	-.08	26
	3rd	-.19	-.22	-.41	7
Becton	Basement	.17	.23	.40	27
	1st	-.19	-.25	-.44	17
	2nd	.00	.14	.13	18
	3rd	.10	.03	.13	23
Berry	Basement & 1st	.32*	.09	.41	14
	2nd & 3rd	.07	.15	.22	22
Bowen	2nd	-.05	-.20	-.24	7
	3rd	-.20	.15	-.05	19
	4th	-.04	.07	.02	7
	5th	.01	.06	.07	14
	6th	.16	.16	.32	17
	7th	-.02	.09	.07	13
	8th	.12	.02	.14	19
	9th	-.12	-.07	-.19	23
Bragaw	1-A	.12	.05	.17	8
	1-B	-.39*	.36	-.04	9
	1-C	.04	-.03	.01	11
	1-D	.58*	-.12	.45	9
	2-A	.08	.19	.27	8
	2-B	-.09	.22	.13	4
	2-C	.09	-.01	.08	6
	2-D	.47	-.22	.25	10
	3-A	-.13	.02	-.11	5
	3-B	-.55	-.24	-.80	4
	3-C	-.13	.31	.18	6
	3-D	.26	-.02	.24	14
	4-A	.31	-.15	.16	9
	4-B	.23	-.23	.00	6
	4-C	.14	-.14	.00	12
	4-D	.37*	-.02	.35	10
Carroll	2nd	.16	.08	.24	14
	3rd	.05	-.10	-.05	13
	4th	00	.07	.07	12
	5th	.21	.04	.26	16
	6th	.20	.06	.26	16
	7th	-.15	.02	-.13	11
	8th	-.27	.01	-.26	11
	9th	.11	.02	.13	17
	10th	.11	-.46	-.35	6
Gold	Basement & 1st	-.19	.17	.35	11
	2nd & 3rd	-.25	-.12	-.37	18

*ADJGAIN significantly different from 0, $p<.05$

TABLE 2 (cont.)

Building	Section/ floor	ADJGAIN	ADJUPGA	ADJGPA	# of Freshmen
Lee	Basement	.31	-.17	.14	8
	1st	.03	.14	.11	16
	2-A	.11	-.11	00	18
	2-B	.06	.13	.19	23
	3-A	-.10	.04	-.07	18
	3-B	-.05	-.25	-.30	19
	4-A	-.32	-.22	-.54	14
	4-B	.08	-.008	.07	18
	5-A	-.14	-.04	-.19	12
	5-B	-.09	-.05	-.14	6
	6-A	-.40	-.11	-.50	110
	6-B	-.32	-.20	-.52	10
	7-A	-.10	.01	-.09	12
	7-B	.14	-.23	-.09	11
	8-A	.13	-.34	-.21	9
	8-B	-.08	.11	.03	22
	9-A	-.20	-.10	-.30	1
	9-B				
Metcalf	2nd	-.20	.03	-.17	29
	3rd	-.03	.20	.17	26
	4th	.27*	.19	.46	28
	5th	-.10	.12	.02	30
	6th	.09	.05	.14	27
	7th	-.06	-.08	-.14	29
	8th	.20*	.22	.43	27
	9th	-.22	-.06	-.28	27
	10th	.18	.00	.18	26
	11th	-.02	.12	.10	22
	12th	.04	-.07	-.03	25
Owen	Basement	.15	-.02	.13	15
	1-A	-.14	00	-.14	17
	1-B	.08	.15	.22	26
	2-A	-.10	-.02	-.12	14
	2-B	-.06	.17	.10	7
	3-A	-.32	-.09	-.41	18
	3-B	-.04	00	-.04	23
Sullivan	1st	.50	.46	.97	3
	2nd	.15	-.20	-.05	21
	3rd	.01	-.14	-.13	27
	4th	-.11	-.20	-.32	17
	5th	-.17	0.18	.34	32
	6th	-.24	.03	-.20	36
	7th	-.16	-.05	-.21	40
	8th	-.05	-.05	-.10	37
	9th	-.02	00	-.02	18
	10th	.04	-.07	-.03	33
	11th	-.20	.01	-.19	33
	12th	-.10	-.03	-.14	26
Syme	Basement	-.15	.01	-.13	14
	1st	.38	-.02	.35	5
	2nd	.12	-.05	.08	14
	3rd	.14	-.05	.08	14
Tucker	Basement	-.09	-.10	-.20	20
	1-A	.11	.14	.26	14
	1-B	-.13	.01	-.12	17
	2-A	-.17	.09	-.09	18
	2-B	.27	-.01	.26	17
	3-A	.21	.04	.25	20
	3-B	-.19	-.04	-.23	18
Turlington	1st	.19	-.26	-.07	7
	2nd	.00	.12	.12	11
	3rd	-.04	.07	.03	11
Welch	Basement & 1st	.85	-.17	.67	1
	2nd & 3rd	-.14	-.11	-.25	3

TABLE 3

YEARS ON STAFF AND ACADEMIC GAIN

Years as Resident Advisor	ADJGAIN	ADJUPGA	ADJGPA	# of Freshmen
1	.008	-.010	-.002	1201
2	-.006	.004	-.002	421
3	-.045	.067	.021	158

NO ADJGAIN scores were significantly different from zero.

TABLE 4

ARCHITECTURAL TYPE AND ACADEMIC GAIN

Type Architecture	Building	ADJGAIN	ADJUPGA	ADJGPA	# of Freshmen
High rise, medium size suite building with closed circulation	Bowen Carroll Metcalf	.017	.047	.064	531
High rise large size suite building with open circulation	Lee Sullivan	-.068*	-.061	-.129	550
Low rise, medium size double room with closed hallway circulations	Alexander Bagwell Becton Owen Syme Tucker Turlington	.012	.014	.026	499
Low rise suite building with open circulation	Bragaw	.138*	-.013	.126	131
Low rise small double room building with closed circulation	Berry Gold Welch	.058	.052	.109	69

*ADJGAIN significantly different from 0, $p<.05$

TABLE 5

CORRELATIONS BETWEEN PERCENTAGE OF FRESHMEN AND ADJUSTED GAIN SCORES WITHIN HOUSING UNITS

Housing Unit	N	Correlation	Probability of Significance
All halls	16	- .369	.157
Halls without special educational programming	13	- .788	.002
Sections	109	- .073	.541

Chart 1

Plot of Adjusted Gain VS Percentage of Freshmen for All Halls

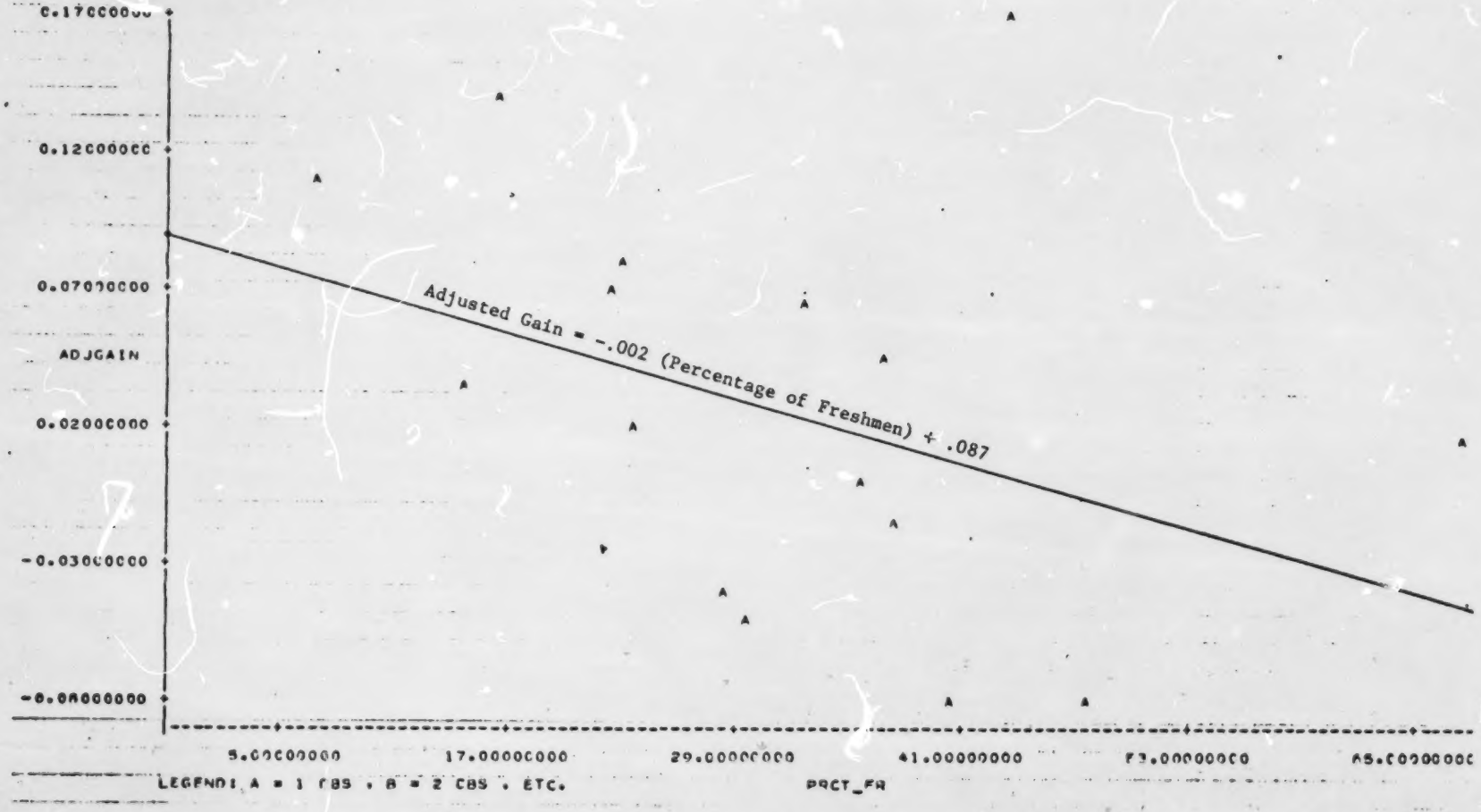


Chart 2

Plot of Adjusted Gain VS Percentage of Freshmen for All Halls
Without Special Educational Programming

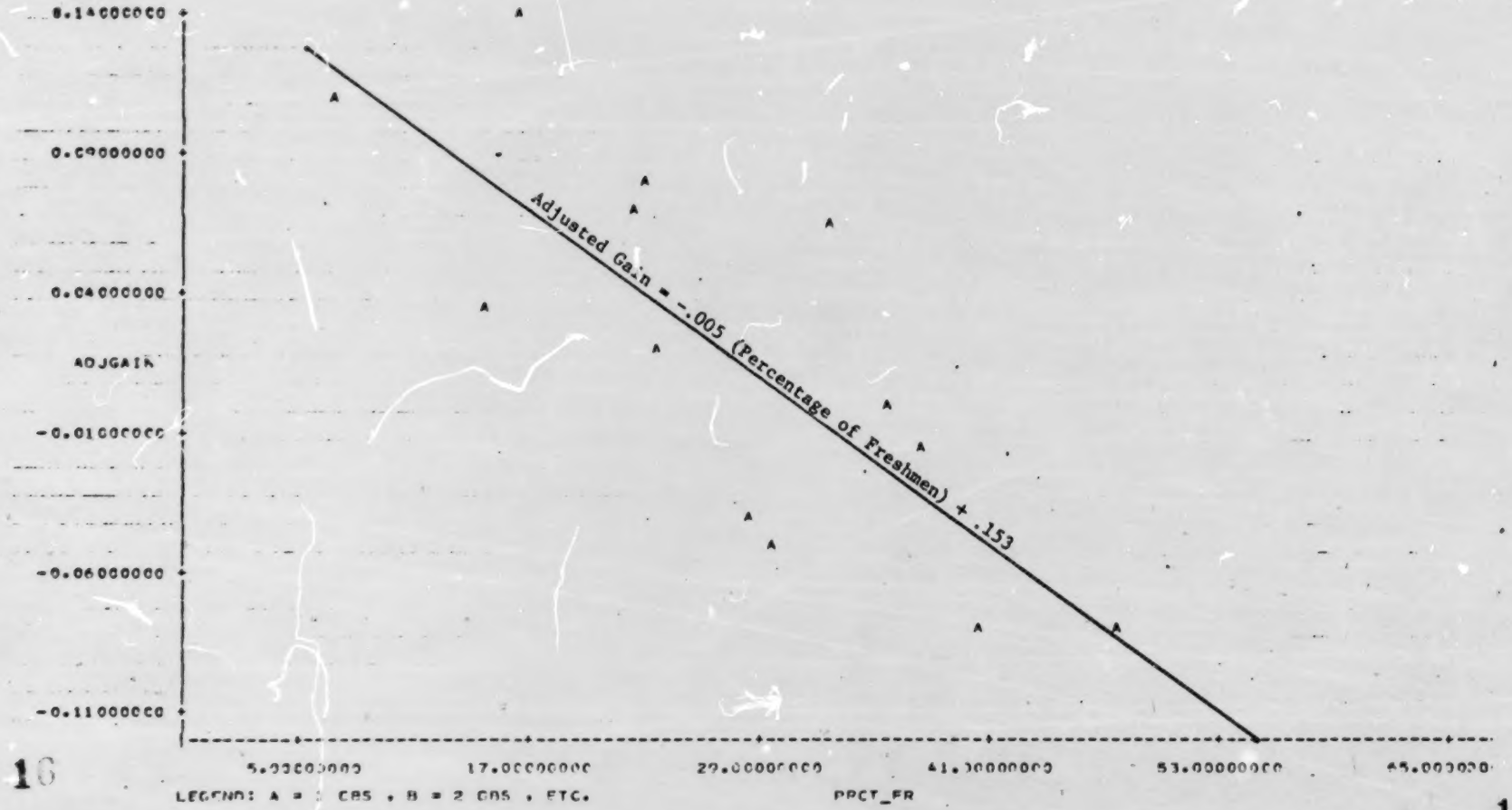
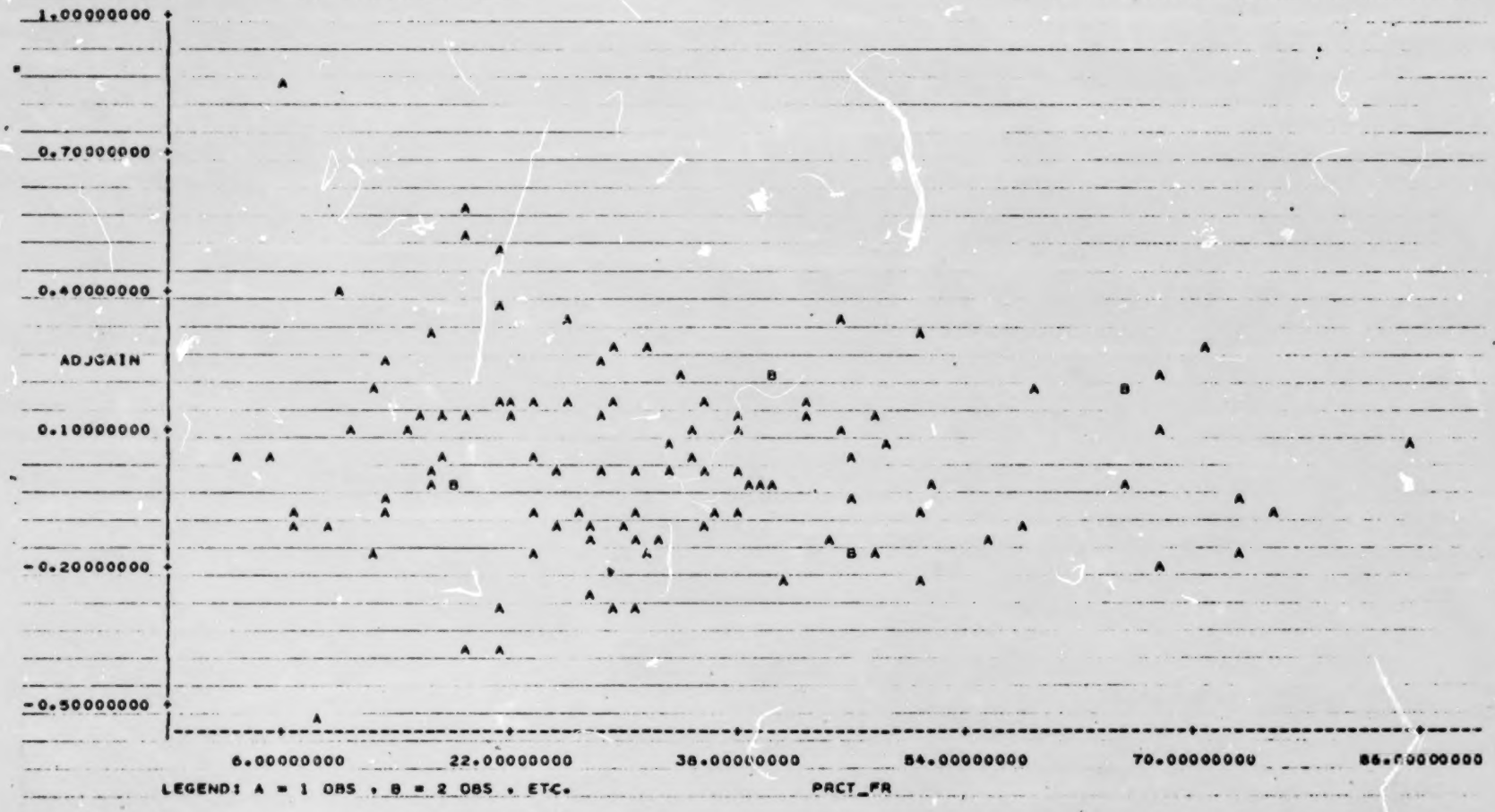


Chart 3

Plot of Adjusted Gain VS Percentage of Freshmen For All Sections



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